

Midterm Sample Solutions

1. (a) $0.5(f(0.5) + f(1) + f(1.5) + f(2)) = 0.5(-0.25 + 0 + 0.75 + 2) = 1.25$

(b) $\frac{2}{3}$

2. $f = c, f' = b, \int_0^x f(t)dt = a$

3. (a) 37

(b) -76

(c) $\frac{\sin 1}{3}$

(d) $\frac{1}{2\pi} \sin^2 \pi t + c$

(e) 5

(f) $\frac{\pi}{16}$

(g) $\frac{\sin^{-1}(x^2)}{2} + c$

(h) $\frac{\ln |x^2 + 2x|}{2} + c$

4. $F'(x) = \sqrt{1 + x^2}$

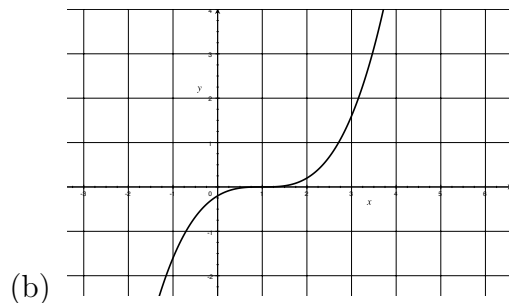
5. (a) $\frac{175}{6}$

(b) $\frac{59}{2}$

6. $\frac{1 - \cos 4}{4}$

7. No, it is not one-to-one. It fails the horizontal line test.

8. (a) $g^{-1}(2) \approx 0.2$



9. $f^{-1}(x) = \frac{1 - x}{2x - 1}$

10. (a) 9
(b) π
(c) 2
11. (a) $\sqrt{e+1}$
(b) $\frac{\ln(5^d)}{\ln c}$
12. (a) $\frac{1+\ln x}{x \ln x}$
(b) $\frac{1}{2(x^2+1)\sqrt{\tan^{-1} x}}$
(c) $2(4^{2x}) \ln 4$
(d) $\frac{4}{\sqrt{1-16x^2}}$
13. (a) $200(3.24)^t$
(b) $\approx 22,040$
(c) $\approx 25,910$ bacteria/hour
(d) $\frac{\ln 50}{\ln 3.24} \approx 3.33$ hours
14. (a) $\frac{x}{\sqrt{x^2+1}}$
(b) $\frac{1-x^2}{x^2+1}$